

Concurrency

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AIMS AND SCOPE

Recent developments in technology have stimulated the development of **concurrent** computers. These machines consist of a collection of processors connected in a network—or alternatively a collection of processors sharing access to a common memory. They include both general purpose MIMD and SIMD architectures and special purpose systems such as neural networks. There are now several commercially available concurrent computers and an increasing number of microprocessor chips specifically designed to permit the construction of parallel computers varying in size from PC add-in boards with a few processors to 64,000-processor supercomputers. Networks of workstations are challenging traditional supercomputers. Further, we see a rapid increase in wide-area network performance and deployment with a blurring and convergence of computing and communication. The combination of concurrent digital and optical technology is expected to create a Global Information Infrastructure (GII) that will enable new applications, and open up a new set of communication and computer software and architecture challenges. We need portable and scalable (portable to the future and to hybrid heterogeneous world-wide systems) solutions.

These high-speed networks and machines are being successfully applied in a wide range of academic, research, and commercial application areas. This use is producing a substantial amount of practical experience in those problems that parallelize well and the features of hardware and systems software needed to use concurrency effectively. These are also new computational methods, such as cellular automata and massively parallel neural networks, which are particularly suited to concurrent execution. There is a rapid growth in both scientific (grand challenges) and information (national challenge) applications. These will impact academia, business, the home, and education. New applications are also being opened up by advances in human-computer interfaces with full immersive environments soon to be generally available. Until now there has been no journal which brings this work together. Results, if published at all, are scattered through specialized technical journals.

This journal will therefore focus on practical experience with concurrent machines and high-speed networks, especially:

- Concurrent solutions to specific problems in academia and industry
- Concurrent algorithms and computational methods
- Programming environments, operating systems, and tools
- New languages
- Performance design, analysis, models and results
- Applications, and algorithm and software technologies arising from the GII, and the unification of computing and communication.

The papers will all have a practical or phenomenological emphasis. Authors wishing to submit a paper to the journal should contact the editor directly at the address given below.

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EDITOR

Professor Geoffrey C. Fox, *Northeast Parallel Architectures Centre, Syracuse University, 111 College Place, Syracuse, NY 13244-4100, U.S.A.*

Telephone (315) 443 2163; Fax: (315) 443 4741; e-mail: gcf@npac.syr.edu.

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